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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PHILIPPE SCHOTTLAND

Appeal 2009-1141
Application 10/063,792
Technology Center 1700

Decided:¹ March 30, 2009

Before PETER F. KRATZ, JEFFREY T. SMITH, and
KAREN M. HASTINGS, *Administrative Patent Judges*.

Opinion Concurring filed by *Administrative Patent Judge* KRATZ.

Opinion Dissenting-In-Part filed by *Administrative Patent Judge* HASTING.

SMITH, *Administrative Patent Judge*.

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the decided date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

DECISION ON APPEAL

Statement of the Case

This is an appeal under 35 U.S.C. § 134 from a final rejection of claims 1-23, 28-41, and 78-80, all of the pending claims. We have jurisdiction under 35 U.S.C. § 6.²

Appellant's invention relates to plastic articles that are formed from a combination of a transparent plastic and a photoluminescent material. The Specification discloses that these articles provide an aesthetic visual effect in the form of a colored glow at cuts or protrusions formed in the surface of the article. (Spec. 2). Claim 1 is illustrative:

1. An article, wherein the article is a bottle comprising an angular portion comprising a molded body formed from a plastic composition comprising a plastic having an index of refraction of it least 1.4 and a photoluminescent material, wherein the angular portion has a graphic image formed at cuts or protrusions, or both, in the plastic composition on a surface of the molded body thereof to provide a luminescent visual effect in the shape of a graphic image as a result of a photoluminescent material that is part of the plastic composition.

The Examiner rejected the claims on appeal as follows:

Claims 1-3, 8-10, 13-16, 18, 19, 21-23, 28-33, 35, 36, 38, 39, and 78-80 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Brown (U.S. 3,417,175, issued December 17, 1968) combined with Pollard (U.S. 3,728,143, issued April 17, 1973). Claims 4, 7, 17, 20, 34, and 37 stand

² In rendering this decision we have considered the Appellant's arguments presented in the Appeal Brief dated January 19, 2007 and the Reply Brief dated June 6, 2007.

rejected under 35 U.S.C. §103(a) as unpatentable over the combined teachings of Brown, Pollard, and Madalo (U.S. 3,573,472, issued April 6, 1971). Claims 11, 12, 40, and 41 stand rejected under 35 U.S.C. §103(a) as unpatentable over the combined teachings of Brown, Pollard, and Lee (U.S. 5,066,580, issued November 19, 1991).

The issue before us is whether Appellant has shown that the Examiner reversibly erred in rejecting the claims under 35 U.S.C. §103(a).³

Appellant contends that “to suggest this invention the combination of references [Brown and Pollard] must suggest that the material of Pollard be dispersed throughout the bottle. Such a suggestion is not found in the references.” (App. Br. 3). Appellants further contends “to the extent that a combination with Pollard is suggested, the objective combination would be to add Pollard colorant to the relief area only since this is where the color is disclosed in the Brown reference.” (App. Br. 3). Regarding the dependent claims that specify the presence of the florescent dyes, Appellant avers that Pollard discloses pigments not dyes. (App. Br. 3-6).

The Examiner found that Brown disclosed a molded bottle comprising an angular portion having a graphic image formed from a plastic composition. (Ans. 3; Brown, col. 10, ll. 21-34). The Examiner found that Brown disclosed polycarbonate as a suitable material for the plastic composition (having an index of refraction of at least 1.4). (Ans. 3; Brown, col. 9, ll. 29-30). The Examiner recognizes that Brown did not describe a

³ Appellant has not presented separate arguments for the claims 1, 14, 28, 29, 39, and 78-80. We select independent claim 1 as representative of these rejected claims. With regard to claims 2-13, 15-23, 30-38, 40, and 41 we select claim 2 as representative of these rejected claims.

photoluminescent material was utilized to provide a visual effect in the shape of a graphic image. (Ans. 3). The Examiner found that Pollard teaches photoluminescent material suitable for use with plastics such as polycarbonate. (Ans. 4; Pollard, col. 8, ll. 27-48, col. 6, ll. 49-62). The Examiner contends that it would have been obvious to a person of ordinary skill in the art to utilize photoluminescent materials in the plastic articles of Brown. (Ans. 3-4). With regard to claims 2-13, 15-23, 32-38, 40, and 41 the Examiner contends that Pollard is evidence that would have suggested utilizing florescent dyes as the photoluminescent material suitable for use with thermoplastics. (Ans. 4-7).

Claims 1, 14, 28, 29, 39, and 78-80.

We have thoroughly reviewed each of Appellant's arguments for patentability. However, we find the Examiner's rejection of claim 1 to be well-founded and supported by the prior art evidence relied upon. Accordingly, we will sustain the Examiner's rejection for the reasons set forth in the answer and we add the following.

It is not in dispute that the Brown utilizes a separate plastic (adherent) sheet that is attached to the plastic article to provide color to the graphic area. (Brown, col. 3, l. 59 - col. 4, l. 2; col. 10, ll. 21-34). Brown discloses the plastic articles can be formed from polycarbonates. (Brown, col. 3, ll. 15-24). The Examiner correctly found that Pollard discloses photoluminescent materials (pigments) are suitable for coloring polycarbonates. (Pollard, col. 6, ll. 49-59; col. 8, ll. 27-48). Consequently, we agree with the Examiner's conclusion that it would have been obvious to a person of ordinary skill in the art to have utilized the photoluminescent

material of Pollard to provide color to the graphic area of the plastic articles of Brown. A person of ordinary skill in the art would have reasonably expected that the described photoluminescent pigments of Pollard would have been suitable for the plastic articles of Brown. Accordingly, we are of the opinion that, prima facie, one of ordinary skill in this art routinely following the combined teachings of Brown and Pollard would have reasonably arrived at the claimed article containing a photoluminescent material encompassed by claim 1 without recourse to Appellant's Specification. *See, e.g., KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1740 (2007) ("when a patent claims a structure already known in the prior art that is altered by mere substitution of one element for another known in the field, the combination must do more than yield a predictable result"); *see also In re Kahn*, 441 F.3d 977, 985-88 (Fed. Cir. 2006); *In re O'Farrell*, 853 F.2d 894, 903-04 (Fed. Cir. 1988) ("For obviousness under § 103, all that is required is a reasonable expectation of success." (citations omitted)).

We do not agree with Appellant's arguments that Brown and Pollard must suggest dispersing the photoluminescent material throughout the bottle. The claimed invention only requires the presence of a photoluminescent material in the graphic area to provide a luminescent effect. As set forth above, it is not disputed the Brown suggests utilizing color in the graphic portion of the plastic article. Since Brown discloses the colored portion of the plastic article can be formed from polycarbonates and Pollard discloses the use of photoluminescent pigments for coloring polycarbonates, a person of ordinary skill in the art would reasonably expected that photoluminescent

pigments would have been suitable for use as the coloring agent in the colored portion the invention of Brown.

For the foregoing reasons and those presented in Answer, the rejections of claims 1, 14, 28, 29, 39, and 78-80 under 35 U.S.C. § 103(a) is affirmed.

Claims 2-13, 15-23, 30-38, 40, and 41

The issue before us is whether Appellant has shown that the Examiner erred in rejecting the claims under 35 U.S.C. § 103 (a). We answer this question in the affirmative. Therefore, WE REVERSE.

The Examiner bears the initial burden of presenting a prima facie case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). In order to establish a prima facie case of obviousness, the Examiner must show that each and every limitation of the claim is described or suggested by the prior art or would have been obvious based on the knowledge of those of ordinary skill in the art. *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988)). “[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (*quoted with approval in KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007)).

The rejected claims further describe the claimed articles as including organic fluorescent dyes. The Examiner contends that Pollard is evidence that would have suggested utilizing florescent dyes as the photoluminescent material suitable for use with thermoplastics. (Ans. 4-7).

Appellant contends that the rejection is not proper because Pollard describes pigments and not dyes. We agree.

The Examiner specifically identifies of Pollard column 6 as describing the photoluminescent material. Pollard specifically states:

The term pigment mean substances which are generally considered insoluble in the vehicle, and pigments generally have the property of light refractivity. (Dyes are considered soluble and generally have a property of light absorption.) Phosphorescent, luminescent, florescent, metalescent, and pearlescent materials fit within the term pigment, as used herein and in the art.

(Pollard, col. 6, ll. 49-56; emphasis added).

It is clear from the description of the Pollard reference that the fluorescent materials described in the therein are directed to pigments not dyes. Contrary to the Examiner's position, Pollard does not provide a description of organic fluorescent dyes. Thus, Pollard is not suggestive of the fluorescent dyes as specified by claims 2-13, 15-23, 30-38, 40, and 41.

The Examiner relied on the Madalo and Lee references to address specific dye characteristics of the various rejected claims. The Examiner relied upon these references in combination with the Pollard reference to render the claimed subject matter unpatentable. The Examiner did not independently determine that these references would have suggested utilizing florescent dyes in the invention of Brown. Thus, the combination of Brown and Pollard with Madalo or Lee does not address the distinction between the claimed invention and the invention of Brown discussed above. Therefore, we reverse the Examiner's rejections that rely upon the combination of Brown and Pollard with Madalo or Lee.

For the foregoing reasons and those presented in Appellant's Briefs, the rejections of claims 2-13, 15-23, 30-38, 40, and 41 under 35 U.S.C. § 103(a) are reversed.

ORDER

The decision of the Examiner rejecting claims 1, 14, 28, 29, 39, and 78-80 under 35 U.S.C. § 103 (a), is affirmed.

The decision of the Examiner rejecting claims 2-13, 15-23, 30-38, 40, and 41 under 35 U.S.C. § 103 (a) is reversed.

AFFIRMED-IN-PART

KRATZ, *Administrative Patent Judge*, Concurring.

I fully concur with the Decision, set forth in the accompanying Opinion for the Board, which I join in rendering the Decision ordered herein.

Concerning our affirming of the Examiner's decision to reject claims 1, 14, 28, 29, 39, and 78-80 under 35 U.S.C. § 103(a) as being unpatentable over Brown combined with Pollard, I write separately to emphasize my agreement with the Examiner's obviousness position as to the representative claim 1 subject matter and the Examiner's rebuttal of Appellant's contentions in opposition thereto (Ans. 3, 4, 7, and 8).

In this regard, I concur with the Examiner's observation that the combined teachings of Brown and Pollard would have reasonably suggested the use of a polycarbonate containing a photoluminescent material dispersed throughout the molded bottle disclosed by Brown, which would place the photoluminescent material at the relief area of the molded article (bottle) of Brown (Ans. 7; Brown, col. 3, ll. 55-58). Representative claim 1 requires that the claimed article is such that a luminescent visual effect in the shape of a graphic image (relief area) of the molded bottle body can be furnished by the claimed article; however, representative claim 1 does not require that the claimed article can only furnish a luminescent visual effect limited solely to the shape of the graphic image area.

Concerning our reversing of the Examiner's rejection of claims 2, 3, 8-10, 13, 15, 16, 18, 19, 21-23, 30-33, 35, 36, and 38 under 35 U.S.C. § 103(a) as being unpatentable over Brown combined with Pollard, I write separately to emphasize that the Examiner's obviousness position as to the

commonly required fluorescent dye limitation of these claims is premised on the Examiner's assertion that "... the material disclosed by Pollard is fluorescent (column 6, lines 53-55), therefore including xanthene" (Ans. 4).⁴

However, as pointed out in the Board Opinion, Pollard does not describe xanthene dye at the location of the reference pointed out by the Examiner. Rather, Pollard makes it fairly clear that the subject matter they are concerned with involves fatty acid amide coated pigments and their preparation, which coated pigments themselves are solid and used for coloring thermoplastic material (see generally Pollard).

Appellant has reasonably identified this error in the Examiner's obviousness position of claim 2, which error also pertains to the other commonly rejected claims requiring a fluorescent dye (App. Br. 3-4; Reply Br. 1-2).

The Examiner's rebuttal position questions how Pollard could mean what is disclosed about "phosphorescent, luminescent, fluorescent, metalescent and pearlescent materials" being a pigment when Appellant's claim 2 requires "an organic fluorescent dye" (Ans. 8). This is followed by an assertion by the Examiner that the terms "pigment" and "dye" are interchangeably employed in the art (*id.*). However, these terms are not used

⁴ Kozak et al., as referred to by the Examiner, is not a reference identified by the Examiner in the statement of the evidence being relied upon in rejecting the claims furnished in the first sentence of the rejection or in the listed evidence (Ans. 3-4). Accordingly, I do not consider Kozak et al. to be properly before us in considering the merits of the Examiner's rejection. See *In re Hoch*, 428 F.2d 1341, 1342 n.3 (CCPA 1970).

interchangeably by Pollard (Pollard, col. 6, ll. 50-56). Moreover, Appellant does not use these terms interchangeably in the subject Specification (Spec. ¶ 0022 - ¶ 0025). In this regard, the nano-colorants described by Appellant are disclosed as having the characteristics of both a pigment and a dye; thus, preserving the distinction between dyes and pigments Spec. ¶ 0024).

Even if the claimed dye could be construed as including a nano-colorant, the Examiner has not explained where Pollard describes or suggests a nano-colorant, such as a polymer coated dye of a size less than 100 nanometers. Indeed, Pollard discloses the use of a fatty acid amide coated pigment, as noted above, and teaches that the size of the coated pigment is on the order of about 2/16 to 3/16 of an inch (col. 7, ll. 37-39).

Accordingly, I agree with Appellant's contention that the Examiner's application of Pollard to the claims including a dye limitation misapplies the reference's teachings. Consequently, Appellant has established reversible error in the Examiner's obviousness position as to the rejection of claims 2, 3, 8-10, 13, 15, 16, 18, 19, 21-23, 30-33, 35, 36, and 38 under 35 U.S.C. § 103(a) as being unpatentable over Brown combined with Pollard.

The Examiner has not further explained how Madalo or Lee would make up for the deficiencies in the applied prior art evidence relied upon caused by the Examiner's misapplication of Pollard to the fluorescent dye limitation required by the claims subject to the Examiner's latter two obviousness rejections; that is, the Examiner's decision to reject claims 4 -7, 17, 20, 34, and 37 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Brown, Pollard, and Madalo; and

the Examiner's decision to reject claims 11, 12, 40, and 41 under 35 U.S.C. §103(a) as unpatentable over the combined teachings of Brown, Pollard, and Lee.

Accordingly, I concur with and join the Board Decision in ordering reversal of the Examiner's decision to maintain these latter rejections.

HASTINGS, *Administrative Patent Judge*, Dissenting-In-Part.

I agree with the conclusions of my colleagues as to the affirmance of the Examiner's § 103 rejection based on Brown and Pollard with respect to claims 1, 14, 28, 29, 39, and 78-80. However, I must, respectfully, dissent from the findings and conclusions as to the Examiner's § 103 rejection based on Brown and Pollard with respect to 2, 3, 5, 6, 8-10, 13, 15-19, 22, 23, 30-33, 35, 36, and 38. I also dissent from the conclusions made by my colleagues as to the Examiner's § 103 rejection based on Brown, Pollard, and Madalo with respect to claims 4, 7, 17, 20, 34, and 37, as well as to the Examiner's § 103 rejection based on Brown, Pollard, and Lee with respect to claims 11, 12, 40, and 41.

Appellant argues claims 2, 3, 5, 6, 8-10, 13, 15-19, 22, 23, 30-33, 35, 36, and 38 as a group. In my view, the critical limitation in this group that is in dispute is best exemplified in claim 30:

“wherein the photoluminescent material is a fluorescent dye.”⁵

In my opinion, Appellant's contention that Pollard only describes the use of fluorescent pigments and thus fails to teach a fluorescent dye is not persuasive of error in the Examiner's obviousness determination (App. Br. 4). In my view, the combination of Brown and Pollard does indeed render obvious the use of a “fluorescent dye” as recited in claim 30 (as well as an “organic fluorescent dye” as recited in claim 2) within the meaning of 35 U.S.C. § 103(a).

⁵ Claim 30, in contrast to claim 2 upon which the majority focuses, does not require the presence of an “organic” fluorescent dye.

Principles of Law

Appellant has the burden on appeal to the Board to demonstrate error in the Examiner's position. *See In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006). Therefore, we look to Appellant's Brief to determine if Appellant has shown error in the proffered prima facie case.

A claimed invention is not patentable if the subject matter of the claimed invention would have been obvious to a person having ordinary skill in the art. 35 U.S.C. § 103(a); *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007); *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 13 (1966).

Under 35 U.S.C. § 103, the factual inquiry into obviousness requires a determination of: (1) the scope and content of the prior art; (2) the differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) secondary considerations. *See Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966).

It is a basic principle that the question under 35 U.S.C. § 103 is not merely what the references expressly teach but what they would have suggested to one of ordinary skill in the art at the time the invention was made. *See Merck & Co. Inc., v. Biocraft Labs., Inc.*, 874 F.2d 804, 807 (Fed. Cir. 1989) ("in a section 103 inquiry, 'the fact that a specific [embodiment] is taught to be preferred is not controlling, since all disclosures of the prior art, including unpreferred embodiments, must be considered.'" (quoting *In re Lamberti*, 545 F.2d 747, 750 (CCPA 1976))).

Nor is it necessary that suggestion or motivation be found within the four corners of the references themselves. "The obviousness analysis cannot

be confined by [the] formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of . . . the explicit content of issued patents.” *KSR*, 127 S. Ct. at 1741. The Supreme Court also noted in *KSR* that an obviousness analysis “need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *Id.* at 1740-1741. *See also, DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1361 (Fed. Cir. 2006) (“The motivation need not be found in the references sought to be combined, but may be found in any number of sources, including common knowledge, the prior art as a whole, or the nature of the problem itself.”).

Consistent with *KSR*, the Federal Circuit recently recognized that “[a]n obviousness determination is not the result of a rigid formula disassociated from the consideration of the facts of a case. Indeed, the common sense of those skilled in the art demonstrates why some combinations would have been obvious where others would not.” *Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007). The Federal Circuit relied in part on the fact that Leapfrog had presented no evidence that the inclusion of a reader in the combined device was “uniquely challenging or difficult for one of ordinary skill in the art” or “represented an unobvious step over the prior art.” *Id.* at 1162.

The test for obviousness is what the *combined* teachings of the references would have suggested to those of ordinary skill in the art. *In re Young*, 927 F.2d 588, 591 (Fed. Cir. 1991).

Moreover, it is well settled that, in a section 103 inquiry, “[a]ll the disclosures in a reference must be evaluated, including nonpreferred embodiments, and a reference is not limited to the disclosure of specific working examples.” *In re Mills*, 470 F.2d 649, 651 (CCPA 1972) (citations omitted). *See also In re Boe*, 355 F.2d 961, 965 (CCPA 1966) (“All of the disclosures of a reference must be evaluated for what they fairly teach one of ordinary skill in the art. Thus,...this court affirmed rejections based on art which we concluded rendered the claimed invention obvious to those of ordinary skill in the art despite the fact that the art teachings relied upon in all three cases were phrased in terms of a non-preferred embodiment or as being unsatisfactory for the intended purpose.”)

Analysis with Factual Findings

First, the critical claim limitation must be construed. Claim 1, from which claim 30 directly depends, recites that the molded body comprises “a photoluminescent material”. Appellants Specification defines a “photoluminescent material” as:

any substance that exhibits photoluminescence in response to excitation energy provided by ambient light (sunlight, room light and other artificial light sources), including without limitation organic compounds that solubilize in the plastic polymer matrix during the compounding operation, organic nanoparticle dyes (also known as "nanocolorants") and inorganic photoluminescent materials, including nanoparticles . . . Photoluminescence is a generic term which encompasses both fluorescence and phosphorescence.

(Spec. 6, para. [0022]).

Appellant’s Specification further describes:

Nano-colorants can be obtained by various methods and *usually combine the advantages of both dyes and pigments*. Their light fastness compared to the corresponding dye molecule is usually greatly improved. . . Nano-colorants can be fluorescent if the *dye molecule* (or the inorganic compound) used to prepare the nano-colorant is fluorescent. Specific *non-limiting examples of fluorescent dyes that may be employed to form nano-colorants* used in the articles of the invention are perylene derivatives, anthracene derivatives, indigoid and thioindigoid derivatives, imidazole derivatives, naphthalimide derivatives, xanthenes, thioxanthenes, coumarins, rhodamines, or (2,5-bis[5-tert-butyl-2-benzoxazolyl]-thiophene-) and all their derivatives.

. . . .

Inorganic nano-particles may also be used as nano-colorants although their extinction coefficient is usually fairly low. Examples of fluorescent inorganic nano-particles include, *but are not limited to*, lanthanide complexes and chelates (for instance Europium chelates).

(Spec. 7, paras. [0024], [0025]).

All of the examples described in Appellant's Specification use more than one colorant therein, and several of the examples include pigment based colorants (Spec. 12-17).

In light of all these disclosures in Appellant's Specification, I find that at least the claim limitation to "fluorescent dye" as recited in claim 30 reasonably encompasses an inorganic particle with a dye molecule attached. Furthermore, the open-ended nature of the claims (that is, "comprising") encompass the use of a dye in combination with a pigment. Moreover, even without this claim interpretation, I find that one of ordinary skill in the art would have fully appreciated that colorants for plastic materials included

both dyes (e.g., organic fluorescent dyes) as well as pigments, for the reasons explained below.

As the majority found, it is undisputed that the use of a colorant for the graphic portion of a plastic article (e.g., of polycarbonates) are known as exemplified for Brown's molded bottle (e.g., Ans. 3, 7; Brown, col. 3, l. 53 to col. 4, l. 2; col. 9, ll. 29-30; col. 10, ll. 21-34). The combined teachings of Brown and Pollard would have reasonably suggested the use of a polycarbonate containing a photoluminescent material dispersed throughout the molded bottle disclosed by Brown. It is also undisputed that Pollard discloses the use of photoluminescent pigments (including fluorescent materials) for coloring polycarbonates (e.g., Ans. 4; col. 6, ll. 49-59; col. 8, ll. 27-48). While Pollard clearly prefers the use of pigments to dyes for coloring the plastics (Pollard, col. 6, ll. 51-53), it is well established that all disclosures of the prior art, including nonpreferred embodiments, must be considered. Moreover, we are bound to consider the disclosure of each reference for what it fairly teaches or suggests to one of ordinary skill in the art, including not only the specific teachings, but also the inferences which one of ordinary skill in the art would reasonably have been expected to draw therefrom. See *In re Boe*, 355 F.2d at 965; and *In re Preda*, 401 F.2d 825, 826 (CCPA 1968). In my opinion, one of ordinary skill in the art would have fully appreciated at the time that Appellant's invention was made that dyes and pigments were known alternative colorant agents for plastic materials.

Specifically, one of ordinary skill in the art would have appreciated that "dyes" are both: 1- well known to be attached to pigment particles (e.g.,

a nano-clay particle) to form a colorant (as even admitted in Appellant's Specification), and also 2- well known alternative colorant agents to pigment based colorants. One of ordinary skill in the art would have also been well aware that there is no generally accepted distinction between dyes and pigments as colorants.

The definition of "colorant" as set forth in Hawley's Condensed Chemical Dictionary (emphasis added):

Any substance that imparts color to another material or mixture. Colorants are either dyes or pigments and may be (1) naturally present in a material (chlorophyll in vegetation), (2) admixed with it mechanically (dry pigments in paints), or (3) applied to it in a solution (organic dyes to fibers).

Note: There is no generally accepted distinction between dyes and pigments. Some have proposed one on the basis of solubility or physical form and method of application. Most pigments, so called, are insoluble inorganic powders, the coloring effect being a result of their dispersion in a solid or liquid medium. Most dyes, on the other hand, are soluble synthetic organic products that are chemically bound to and actually become part of the applied material. Organic dyes are usually brighter and more varied than pigments but tend to be less stable to heat, sunlight, and chemical effects. The term colorant applies to black and white, as well as to actual colors. Instruments for measuring, comparing, and matching the hue, tone, and depth of colors are called colorimeters. See also dye; pigment; colorimetry; food color; FD&C color.⁶

⁶ "colorant", Hawley's Condensed Chemical Dictionary, 14th Edition Copyright ©2002 by John Wiley & Sons, Inc.; see also "colorant" Hawley's Condensed Chemical Dictionary, 10th Edition, by Van Nostrand Reinhold Company, Inc., p. 267, 1981.

Accordingly, a person of ordinary skill in the art would have reasonably expected that photoluminescent *pigments and/or* photoluminescent *dyes*, including fluorescent dyes, would have been suitable for use as a colorant agent in the colored plastics portion of the invention of Brown based on the disclosures to photoluminescent pigments (and the non-preferred alternative use of dyes) in Pollard.

Even assuming Appellant's remarks about the possible distinctions between dyes and pigments (e.g., Reply Br. 2) is correct, this is not persuasive of error, in my opinion. In my opinion, the combined prior art of Brown and Pollard reasonably suggest the use of a "fluorescent dye" (in addition to suggesting the use of a fluorescent "pigment" as found by the majority) as a colorant for plastic bottles as set forth in the critical clause of claim 30 to one of ordinary skill in the art. Further, one of ordinary skill in the art is also a person of ordinary creativity, not an automaton. *KSR*, 127 S. Ct. at 1742. One of ordinary skill in the art would have been led to employ workable or optimum amounts of fluorescent dyes versus pigments through routine experimentation to obtain the desired compositions suggested to those of ordinary skill in the art based on the combined teachings of Brown and Pollard.

Furthermore, Appellant has presented no evidence that the use of a dye (e.g., the known fluorescent dye of xanthene as claimed in dependent claim 9) versus a pigment was "uniquely challenging or difficult for one of ordinary skill in the art" or "represented an unobvious step over the prior art." See, e.g., *Leapfrog Enters.*, 485 F.3d at 1162.

Appellant's contentions with respect to the rejection of claims 4, 7, 17, 20, 34, and 37 based on the combined prior art of Brown, Pollard, and Madalo, as well as to the rejection of claims 11, 12, 40, and 41 based on the combined prior art of Brown, Pollard, and Lee, are also not persuasive of reversible error (App. Br. 5, 6). Pollard does suggest the use of a blue, red, orange or green visual effect as recited in these claims (see, e.g., Pollard's examples of iron blue, chrome red, red toners, blue toners, etc. at col. 6, l. 63 to col. 7, l. 10). The use of a dye (versus a pigment) to impart this visual effect would have been well within the level of ordinary skill in the art for reasons explained above. Optimizing appropriate amounts to impart a desired visual effect would also have been within the level of ordinary skill in the art. *See e.g., In re Aller*, 220 F.2d 454, 456 (CCPA 1955) ("[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.").

With respect to claims 11, 12, 40, and 41, Appellant only contends that neither Brown nor Pollard explicitly teach xanthene. However, Appellant does not dispute that xanthene is a known fluorescent dye. Accordingly, in my opinion, the use of the fluorescent dye xanthene, along with its known quantum yield properties as recited in these claims, would have been prima facie obvious in order to obtain a fluorescent coloring effect which is a desirable option as established by the combined applied prior art.

Conclusion

Accordingly, it is my opinion that the Appellant has not met the burden of showing that the Examiner reversibly erred in the obviousness determinations of any of the claims on appeal.

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136.

AFFIRMED-IN-PART

PL Initial:
sld

MARINA LARSON & ASSOCIATES LLC
RE: LEXAN
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